Testing and Product Certification

NIST Standards in Trade Workshop for China on Fire Protection for the Built Environment

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Testing and Product Certification in the U.S.

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What is Certification?

- Testing/Evaluation
- Validation (Conformity Assessment)
- Monitoring or Auditing
  - Follow-up Inspections to insure quality.
- Marking/Labeling
  - Identification of certified products.
  - Standards, Classification, Rating.

Why do we need "Third-Parties"?

"Second Party" = BUYER

(Consumer, Regulator, AHJ)

"First Party" = SELLER

(Manufacturer, Importer, Distributor, Retailer)

Third-Parties provide <u>independent</u> assurance of a product's quality, performance, safety, or suitability for end use.

Why Trust a “Third-Party”?

Their only marketable commodity is: “CREDIBILITY”.
To demonstrate CREDIBILITY Third-Parties obtain “ACCREDITATIONS”.
If buyers feel the 3rd-Party favors the seller he/she can complain to accreditors.
Likewise, if sellers feel the 3rd-Party favors buyers.
Lose ACCREDITATIONS = Lose CREDIBILITY = OUT of BUSINESS.

Levels of Certification: (Private Sector)

- Supplier's Declaration of Conformity (least stringent)
  - Supplier (mfgr., dealer) does testing, validation, and auditing. (Assumed to be biased.)
- Affiliated Certification (Trade Associations)
  - Lab does testing. Association does validation and auditing. (Requires autonomous independent administrator to prevent bias toward members.)
- Third-Party Certification (most stringent, unbiased)
  - Independent agency does testing, validation, and auditing.

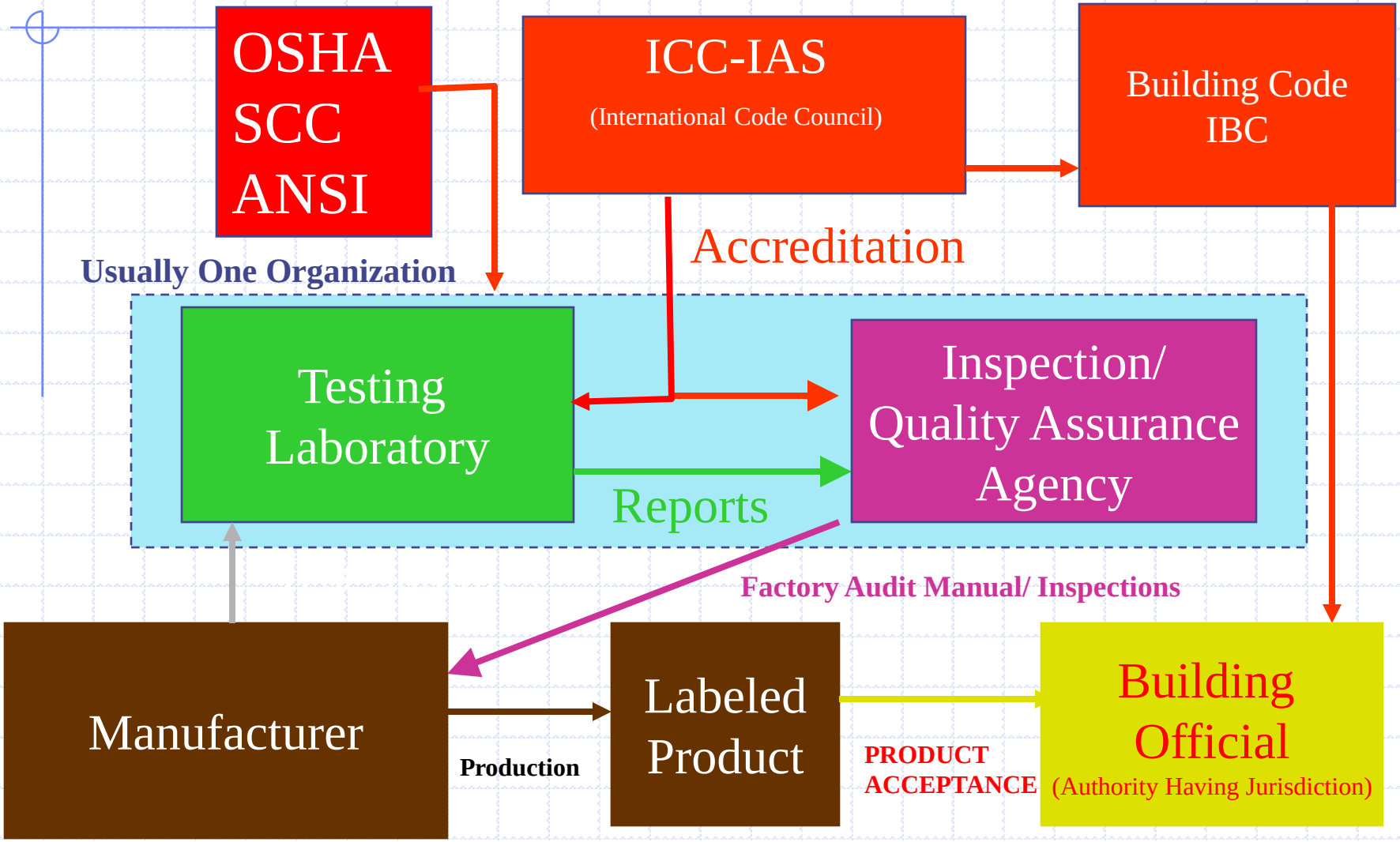
Levels of Certification: (Public Sector)

- DIRECT GOVERNMENT REGULATION
- Examples:
  - Food and Drug Administration (FDA)
  - Federal Aviation Administration (FAA)
  - Environmental Protection Agency (EPA)
  - Occupational Health and Safety Administration (OSHA)
  - State “Weights & Measures Bureaus”.

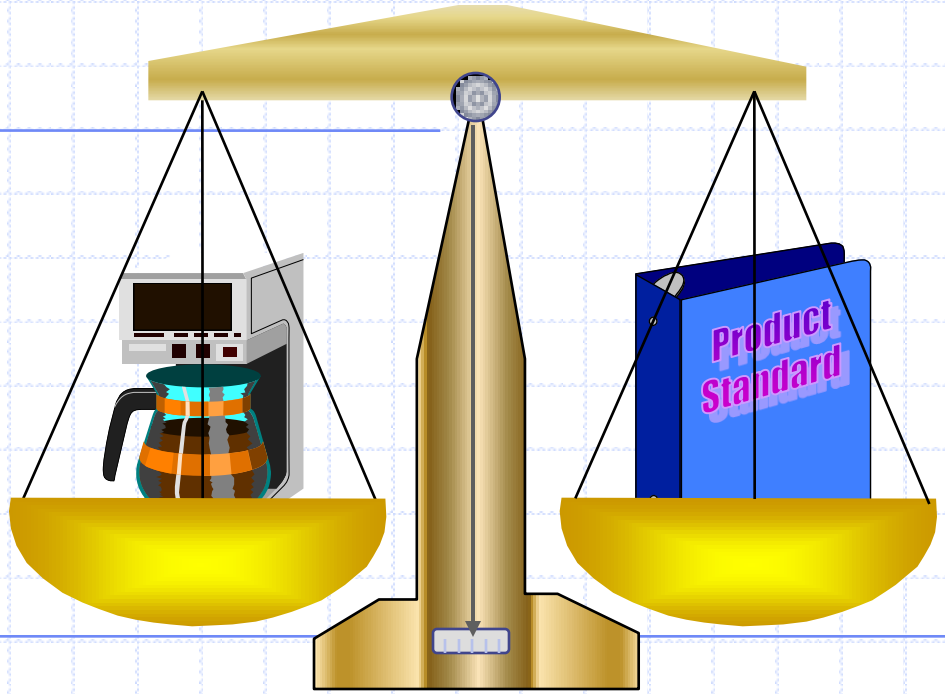
Examples of Third-Party Certification Agencies

- Underwriter's Laboratories - UL (1894)
- Factory Mutual Research Corp. - FM (1941)
- Canadian Standards Association - CSA(1919)
- Intertek Testing Services - Warnock Hersey (1888)
- Southwest Research Institute (1947)
- Omega Point Laboratories (1985)

NATIONAL CODE RECOGNITION



HOW THIRD-PARTY CERTIFICATION WORKS



STEP 1: Identify Product

- What is the product to be certified?
- What **standard**(s) is it to be judged by?
- What are the minimum requirements for acceptance of the product?
- USE OF NATIONALLY RECOGNIZED **STANDARDS** PREFERED!
  - ANSI, ASTM, NFPA, etc.

Step 2: Document Design/Process

- Compare product to design specifications and drawings.
  - Complete?
  - Accurate?
- If process or procedure is critical, witness and document production of samples. (Pretest inspection.)
- In some cases samples are randomly selected from stock by the 3rd-party.

Step 3: Conduct Evaluation

- Sample(s) must be traceable to documented design/process.
- Testing and evaluation under supervision and control of third-party.
- Full compliance with applicable standards required. (Note: In some cases deviations may be allowed if fully disclosed in product markings, literature, etc.)

Step 4: Create Inspection Documentation

- Test Reports.
- Design and process documentation.
- In-Plant Quality Assurance Procedures.
- Marking and Labeling Requirements.
- Listing and Labeling contract.
  - Includes “Authorization to Mark”.

Step 5: Follow-Up Surveillance

- Regular and UNANNOUNCED visits to production facilities.
- Verify that products being "Marked" comply with design, process and QA requirements.
- Document results and report any deficiencies or deviations.
- No product modifications without review and verification of compliance.

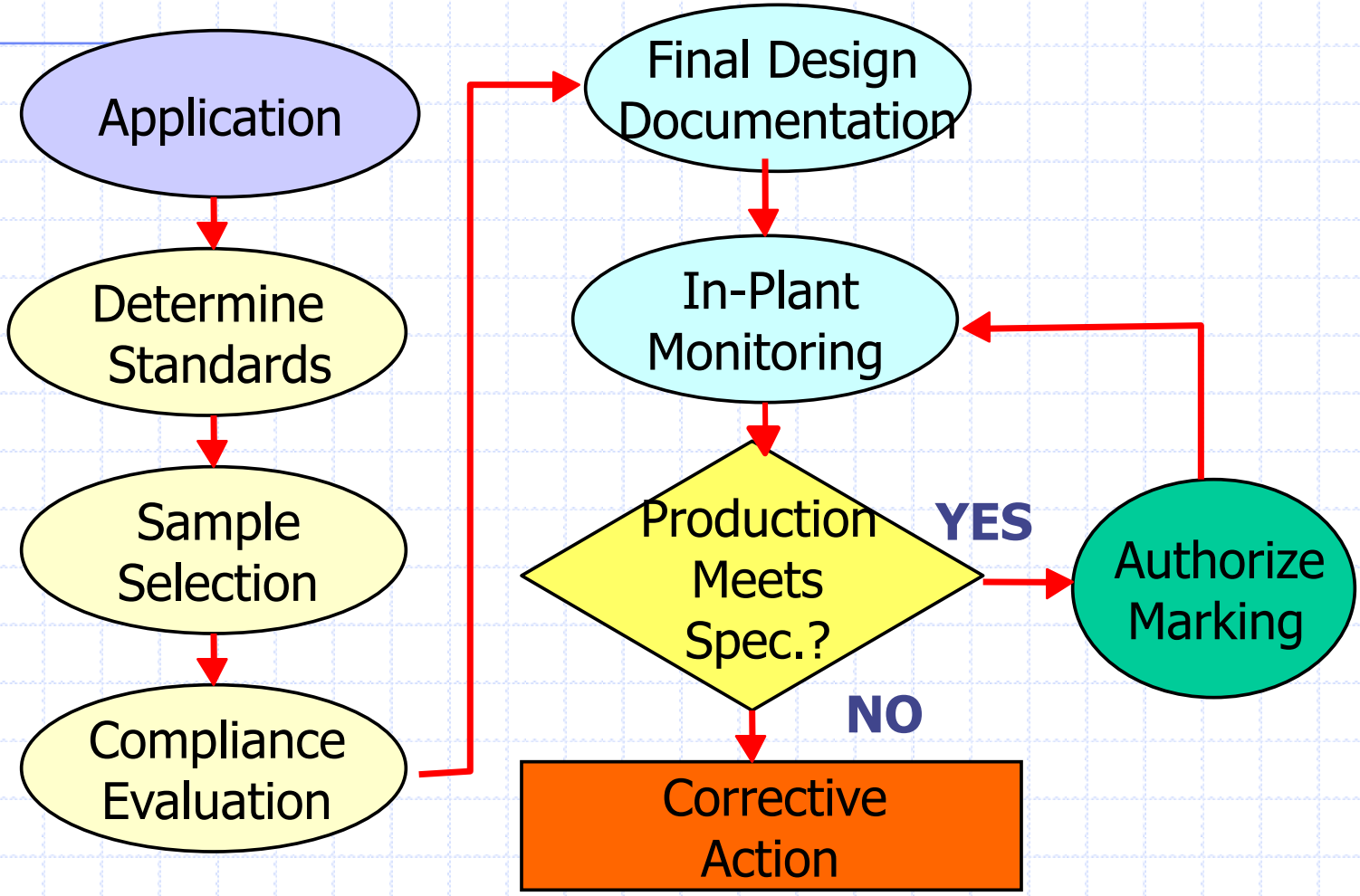
Step 5: Follow-Up Surveillance (continued)

- For some products random sampling and re-testing is the most practical follow-up.
  - Lot by Lot "A.Q.L." Plans.
  - Retail purchase/test programs.
- 100% Inspection may be used for products produced on an infrequent basis or imported in batches.

IMPORTANT!

Without an effective and meaningful FOLLOW-UP SURVEILLANCE PROGRAM the other steps are meaningless! If the producer can submit one product for testing and evaluation and then make and label something different, the point of certification is lost.

Certification Flow Chart



CERTIFICATION MARKS

- These are the Third-Party's identifying symbol(s) registered as "Certification Marks" with the US patent office under "The Lanham Act".
- Third-Party must enforce control of the mark and allow its application only to products produced in compliance with the certification program rules.

IF DEFICINCIES ARE FOUND!

- 3rd-Party must investigate and determine scope/severity of non-compliance.
- Determine appropriate remedial actions.
- If warranted will suspend or revoke authorization to apply certification mark.
- Notification of Authorities of unsafe or hazardous products bearing the “mark”.

Additional Requirements:

- 3rd-Party must have procedure to investigate non-compliance allegations from any source.
- 3rd-Party must have appeals procedure to resolve any issues arising from its compliance or non-compliance determinations.
- Must have procedure to protect client's confidential and proprietary information.

INDEPENDENCE REQUIREMENTS:

- No affiliation or financial interest in producers, vendors or suppliers of products it certifies.
- No stock ownership by employees in companies that produce certified products. (Except through “blind” mutual funds.)
- Employment security of personnel is not subject to influence of clients.
- Sufficient financial strength and diversity of business that the loss or award and any single contract would not affect ongoing operations.

ACCREDITATIONS:

- All major third-party certifiers obtain numerous accreditations required by various authorities.
- Federal Government
  - OSHA “NRTL” Program
  - NVLAP
  - DoD, Navy, Coast Guard
  - HUD

More Accreditors:

- States
- Model Code Agencies - ICC-IAS
- Numerous Cites and Counties
- Insurance Companies
- Accrediting Agencies
  - A2LA
  - ANSI

What do "ACCREDITORS" do?

- Verifies that the Certification agency conforms to standards.
- Most require copies of operating procedure documents, personnel résumés, calibration records, etc.
- Some conduct regular audits of agency's testing and inspection programs.
- Many charge substantial fees.
- Generally publish "Lists" of "Approved" or "Recognized" agencies.

THIRD-PARTIES ALSO MUST COMPLY WITH STANDARDS

- **ISO Guides & Standards**
  - **17025 Testing and Calibration Laboratories**
  - **Guide 65 Third-Party Certification Programs**
  - **17030 Third-Party Marks of Conformity and Their Use**
  - **17020 Inspection**
  - **27 Guidelines for corrective action in the event of misuse of the certification mark.**
  - **Others (39, 40, 53, 56)**
- **ICC-ES - Acceptance Criteria and Rules.**

Fire Related Testing

- Four basic areas
  - Combustibility of Materials
  - Response to Fire
  - Fire Resistance (Containment)
  - Suppression

Fire Test Standards in the IBC

ASTM

- D1929 – Ignition Properties of Plastics
- D2843 – Smoke Density from Burning Plastic
- D3278 – Flash Point of Liquids
- E84 – Surface Burning Characteristics of Building Materials
- E108 – Fire Tests of Roof Coverings
- E119 – Fire Tests of Building Construction and materials
- E136 – Combustibility
- E681 – Limits of Flammability of Chemicals
- E814 – Fire Tests of Through-Penetration Firestops
- E970 – Critical Radiant Flux of Exposed Attic Floor Insulation
- E1966 – Fire-Resistant Joint Systems

Combustibility Response to Fire Fire Resistance

Fire Test Standards in the IBC

- CPSC
  - 16 CFR Part 1404 – Cellulose Insulation
  - 16 CFR Part 1630 – Surface Flammability of Carpets and Rugs
- DASMA
  - 107-97 – Room Fire Test for Garage Doors Using Foam Plastic insulation.
- FM
  - 4880 – Insulated Wall Systems or Wall and Roof/Ceiling Assemblies, Plastic Interior Finish Materials, Plastic Exterior Building Panels, Wall Ceiling Coating Systems, Interior and Exterior Finish Systems

Combustibility Response to Fire Fire Resistance

Fire Test Standards in the IBC

- NFPA
  - NFPA 80 – Fire Doors and Windows
  - NFPA 252 – Test of Fire Door Assemblies
  - NFPA 253 – Critical Radiant Flux of Floor Coverings
  - NFPA 257 – Fire Tests of Window and Glass Block Assemblies
  - NFPA 259 – Potential Heat of Building Materials
  - NFPA 265 – Room Fire Growth Contribution of Textile Wall Coverings
  - NFPA 268 – Ignitability of Exterior Wall Assemblies Using Radiant Heat
  - NFPA 285 – Flammability of Exterior Walls Using Intermediate-Scale Multistory Test Apparatus
  - NFPA 286 – Contribution of Wall and Ceiling Coverings to Room Fire Growth
  - NFPA 701 – Flame Propagation of Textiles and Films

Combustibility Response to Fire Fire Resistance

Fire Test Standards in the IBC

- UL
  - 10A – Tin Clad Fire Doors
  - 10B – Fire Door Assemblies
  - 10C – Fire Door Assemblies Tested Under Positive Pressure
  - 555 – Fire Dampers
  - 555C – Ceiling Dampers
  - 555S – Smoke dampers
  - 790 – Fire Tests for Roof Covering Materials
  - 1040 – Fire Test of Insulated Wall Construction
  - 1256 – Fire Test of Roof Deck Construction
  - 1479 – Fire Test of Through-Penetration Firestops
  - 1715 – Fire Test of Interior Finish Material
  - 1975 – Fire Test of Foam Plastics Used for Decorative Purposes
  - 2079 – Test for Fire Resistance of Building Joint Systems

Combustibility Response to Fire Fire Resistance

Fire Test Standards in the IBC

- ULC
  - S102.2 – Surface Burning Characteristics of Flooring, Floor Coverings and Miscellaneous Materials and Assemblies

Combustibility Response to Fire Fire Resistance